

Transportation and Waste Minimization

A Guide to Identifying Areas for Improvement



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Indiana Department of Environmental Management

Transportation

Why is transportation an issue for schools?

School buses provide a valuable service by carrying students to and from school each day, but the diesel exhaust they produce contains fine particulate matter that pollutes the air. This pollution can reach students inside the bus—even inside the school building. Air pollution is a serious environmental issue, but there are things schools can do to help reduce it.

What is fine particulate matter?

Fine particulate matter (PM), also known as particle pollution, is a mixture of microscopic particles and liquid droplets so small they often get by the body's defense system and settle in our lungs. In fact, PM of as small as 2.5 microns is regulated—that's 28 times smaller than the width of a single human hair. Particle pollution is made up of a number of components, including acids (like nitrates and sulfates), organic chemicals, metals, and soil or dust particles.



What are the health effects of particle pollution?

Particle pollution can cause health problems, including bronchitis and asthma. Long-term exposure to particle pollution can cause lung cancer, heart problems and shorten life spans. Children are more susceptible to the effects of particle pollution because their respiratory systems are still developing.

How can schools reduce particle pollution?

There are a variety of ways schools can reduce particle pollution produced by buses. For example, it is a common misconception that buses need to warm-up for long periods of time during colder months. The truth is that today's buses only need three to five minutes of warm-up time, as long as the outside temperature is at least 32 degrees. Should temperatures fall between 20 and 32 degrees, the warm-up time is 15 minutes; if temperatures are between 5 and 20 degrees, the warm-up time is 30 minutes.

In response to this waste of resources, IDEM and the U.S. Environmental Protection Agency urge schools to create and enforce "no-idling" policies. A no-idling policy means buses will either arrive closer to

student pick-up time or will turn off engines while waiting for students to get out of school. Schools can create an area indoors where bus drivers can wait comfortably during extremely cold or hot months. Parents in the pick-up/drop-off line should also be discouraged from idling.

Where and how buses park while they wait for students can affect student health. For example, when buses park near a school's air-intake vents, the diesel exhaust they produce can easily enter the school's ventilation system. Move the bus area away from air-intake vents to keep this from happening. Another potential problem is bus queuing. Back-to-front emissions of fumes can easily happen in a bus queue. Have buses park diagonally instead. This will help prevent exhaust from entering the bus cabin.

Make the decision to only purchase new buses, when the time comes. New buses will be equipped with technology to reduce the particle pollution produced. Install retrofit technology on existing, older buses.

What are the benefits of a "no-idling" policy?

Participating in a successful no-idling program means schools save money.



Reducing the amount of time buses idle lowers fuel expenses by lowering consumption. Less idling also means less wear-and-tear on engines, extending their lives and lowering maintenance costs. For example, if a fleet of 16 buses idles for 30 minutes less every day, that school corporation will save over \$2,500 per school year in fuel costs. For more information on how your school can reduce emissions, visit the IDEM Web site, at www.IN.gov/idem/programs/air/dieselwise/schoolbuses.html or the U.S. EPA's Web site, at www.epa.gov/otaq/schoolbus.

What is retrofit technology?

Retrofitting school buses means adding new technology to older engines. Retrofit technology includes diesel oxidation catalysts (DOCs) and diesel particulate filters (DPFs). Diesel oxidation catalysts use a chemical process to break down pollutants in exhaust into less harmful components. Diesel particulate filters collect particulate matter in the exhaust stream. Learn more about retrofit technology by visiting the IDEM Web site, at www.IN.gov/idem/programs/air/dieselwise/retrofit.html.

Waste Minimization

What are the benefits of reducing waste?

By practicing waste minimizing techniques, schools can save money and other valuable resources, help our environment and encourage environmental stewardship in students. Schools can even earn money from recycling by establishing a credit account with a local recycling center. Plus, when schools minimize waste they generate community goodwill and set an example for other organizations.


How can schools reduce waste?

Reduce, reuse and recycle is an easy to remember approach to reducing waste. Reduce means making as little waste as possible in the first place, through actions like purchasing in bulk and using the smallest amount of chemicals possible. Reuse means finding new uses for used products, fixing items when they are broken and donating used goods. Schools can donate items, like used electronics, to other schools, reuse shops or non-profit organizations. Recycling means turning our waste into new products that can be sold. Items like metals, paper, glass and plastic can all be recycled with a small amount

of effort. Recycling also means purchasing items made with recycled content. The benefits of recycling are too many to ignore. Recycling conserves energy, preserves our natural resources and decreases greenhouse gas emissions, and it can even earn your school money. Organic waste, like certain food scraps and yard trimmings, can be recycled through composting. Grants are available to schools interested in starting recycling or other waste minimization programs. For more information about waste reduction grants, visit the Recycle Indiana Web site, at www.recycle.IN.gov or check out the Educational Resources CD in your Green Steps Tool Kit.

Where can I find information about a reuse shop near me?

A reuse shop is a store where teachers shop for classroom supplies at little or no cost to them. The items in the reuse shop may be new or used, but they have all been donated by local businesses, schools and individuals. Some reuse shops are sponsored by solid waste management districts. Check with your local solid waste management district for more information about finding a reuse



“Take only as much food to school as you will eat. More than 20 percent of the food we buy gets thrown away.”

shop in your school’s area. To find the solid waste management district in your area, visit the Recycle Indiana Web site, at www.recycle.IN.gov/where/swmd.

What is a waste assessment and how do you do it?

A waste assessment is a procedure schools can use to find out information about how much and what types of wastes they generate.

Most importantly, waste assessments reveal opportunities for waste reduction. Performing a “waste sort” assessment is the most thorough way for schools to assess waste. Follow the steps below to do a waste sort at your school:

- Gather necessary supplies: rubber gloves, a large tarp, garbage bags, five gallon buckets, and a scale.
- Form a team to perform the waste sort.
- Sort and weigh waste from trash bins located in specific areas of the school.
- Evaluate the results and create a waste reduction plan. Decide what items should be getting recycled and think of ways to minimize the use of non-recyclable materials.

To see a sample waste assessment (retrieved from the Oregon Green Schools Web site), check out the Transportation and Waste Minimization CD in your Green Steps Tool Kit. For more information about other types of waste assessments your school can perform, visit the U.S. EPA’s Web site at www.epa.gov/epaoswer/osw/conserve/onthego/program/assess.htm.

What is composting?

Yard clippings and unconsumed food make up a whopping 24 percent of waste that goes into landfills. The good news is that much of this waste can be transformed into valuable compost. Composting is the process of turning organic materials into a soil-conditioner, called humus or compost. Schools can save money by using compost as a soil amendment for gardening, landscaping or indoor plants. Starting a compost program is fairly simple. For more information about composting, visit the IDEM Web site, at www.IN.gov/idem/who/media/factsheets/vermicomposting.html or the U.S. EPA’s Web site, at www.epa.gov/epaoswer/non-hw/composting.

Worm composting, also called vermicomposting, is a great way to get younger students involved in recycling. Worm composting is easy! Get a wide, flat plastic container with a lid and fill it with shredded newspaper, worms, some soil and water. After lunch or snack time, have the students put leftover fruit, vegetable, and bread scraps into the bin. Over time, the worms will eat the food scraps, which then become compost through the worm’s digestive system. Worm compost can be used for landscaping or as a soil fertilizer for

indoor plants. Your school can even sell the compost to earn money for other activities! To learn more about vermicomposting, visit the IDEM Web site, at www.IN.gov/idem/who/media/factsheets/vermicomposting.html or the U.S. EPA’s Web site, at www.epa.gov/epaoswer/education/teach_comp.htm.

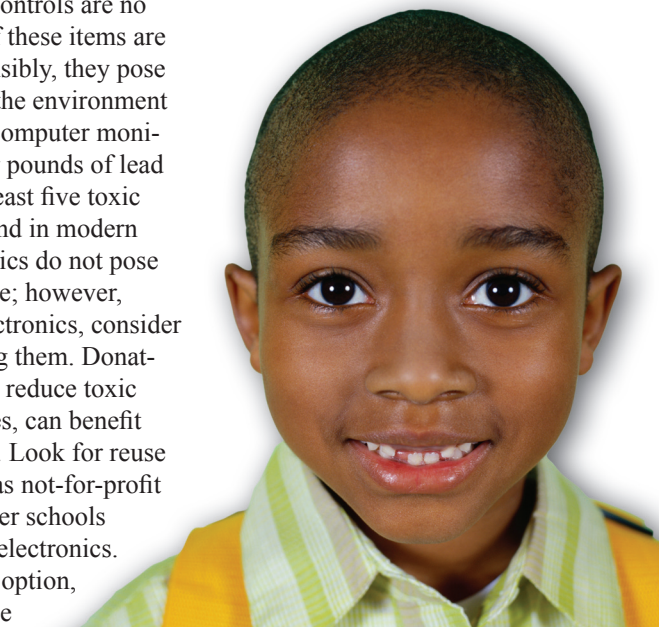
What is e-scrap?


E-scrap is waste produced when electronic devices, such as computer monitors, printers, televisions, cell phones and remote controls are no longer being used. If these items are not discarded responsibly, they pose a potential threat to the environment and human health. Computer monitors can contain four pounds of lead or more. In fact, at least five toxic materials can be found in modern electronics. Electronics do not pose a threat in regular use; however, when discarding electronics, consider donating or recycling them. Donating electronics helps reduce toxic waste and often times, can benefit low-income citizens. Look for reuse organizations, such as not-for-profit agencies or even other schools to donate your used electronics. If donating is not an option, look for a responsible recycling operation

that maintains certifications for safe environmental practices.

How can I start a recycling program at my school?

Starting a recycling program at your school can be fun and simple. Before getting started, create a team to manage the program. The team should then create a budget, decide what materials will be recycled, where the materials will be recycled, establish a system for collecting and storing the materials, and set some overall goals.





"The Green Steps program shows us to recycle newspapers and soda cans."

Schools can conduct a one-time collection of items, like phone books, or establish an ongoing collection of items, like aluminum, paper, plastic and glass. Always contact local authorities to ensure the recycling program is operating within the boundaries of safety and health regulations. For more information about starting a recycling program at your school, visit the IDEM Web site, at www.IN.gov/idem/your_environment/education/schoolnews/recycling.html or visit the U.S. EPA's "Reuse + Recycling = Waste Reduction" book, at www.epa.gov/epaoswer/osw/students/school.pdf.

Check out the IDEM Web site to learn more about transportation and waste minimization issues. Here, schools can find: curriculum, fact sheets, checklists, student activities, info about having an IDEM guest speaker, funding for programs, and much, much more. Visit the IDEM Web site for educators, at www.IN.gov/idem/your_environment/education.